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ABSTRACT

Significant predictors of student attrition, students' tendency to follow the prescribed progression pattern, and the length of time it takes students to graduate from college were studied in a survey of nine predominantly white universities and three predominantly black student universities in southern and border states. All universities were asked to track three cohorts of entering freshmen (1975, 1976, and 1977) through the fall of 1981 with regard to student progression and withdrawal. In addition, black and white students were also tracked separately. The Institutional Data Questionnaire was used in the analysis. Bivariate findings show that race has a strong relationship to students' performance in college, with white students consistently outperforming black students in terms of their attrition rates, tendency to follow the prescribed progression pattern, and mean length of time to graduate. However, racial differences in performance disappear when other student and institutional characteristics are introduced into the prediction models via multiple regression techniques. Four variables repeatedly appear as significant predictors: students' mean Scholastic Aptitude Test (SAT) scores, students' mean family income, type of institution (predominantly white vs. predominantly black), and proportion of students receiving financial aid. High SAT scores, high family income, and attendance at a predominantly black university are generally associated with better performance in college when the effects of other variables are removed. Additional findings regarding student attrition/progression are considered. (SW)

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PREDICTING STUDENT PROGRESSION: THE INFLUENCE OF RACE AND OTHER STUDENT AND INSTITUTIONAL CHARACTERISTICS ON COLLEGE STUDENT PERFORMANCE

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PREDICTING STUDENT PROGRESSION:
THE INFLUENCE OF RACE AND OTHER STUDENT AND INSTITUTIONAL
CHARACTERISTICS ON COLLEGE STUDENT PERFORMANCE

In this study of college student retention and progression, significant differences were found between black and white students in terms of their persistence rates, progression rates (defined as length of time to graduate), and tendency to follow the prescribed progression pattern (sophomore in the second year, junior in the third year, senior in the fourth year, graduate after four years). However, multiple regression analyses show that racial differences disappear when the effects of other student and institutional characteristics are statistically controlled. Therefore, colleges and universities would do well to rethink special retention and counseling programs designed especially to serve minority group students.

PREDICTING STUDENT PROGRESSION: THE INFLUENCE OF RACE AND OTHER STUDENT AND INSTITUTIONAL CHARACTERISTICS ON COLLEGE STUDENT PERFORMANCE

Introduction

In recent decades, educational researchers have devoted considerable attention to the study of student attrition and retention. Such research has for the most part focused on predicting dropout behavior in individuals of differing ability and background, and relating those findings to various institutional characteristics such as size and social climate (Barger & Hall, 1964; Panos & Astin, 1968; Williams, 1966). Increasing attention has also been paid to the college environment (and students' social and academic integration into that environment), and to how that environment affects students' persistence in college (Jones, 1979; Pascarella & Terenzini, 1979; Pfeifer, 1976). These studies have made a valuable contribution to our understanding of students' experiences in college and the effect those experiences have on the decision to withdraw from school. However, by focusing primarily on students who drop out of college in comparison to those who remain, even this contextual research has failed to differentiate the experiences of college students in general. This means that we do not yet have a clear understanding of how college experiences affect students' progression <u>throughout</u> their college career, however long it may be.

In spite of its shortcomings, the multitude of research on college attrition has been important for efforts to desegregate higher education, as it has underscored the fact that ensuring equal access to higher education in no way ensures equality of the educational experience. Since the 1960s, black attendance at institutions of higher education has increased dramatically--from 5 percent of total enrollments in 1966 to 11 percent in 1979--and current research shows that by the late 1970s, proportionately as many blacks were beginning post-

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secondary schooling as whites (McPartland, 1978). In fact, when socioeconomic status and standardized test performance are statistically controlled, blacks now have a higher college enrollment rate than whites (Thomas, 1981b). However, attrition research has shown that the gap in black and white enrollment increases over the college years because more blacks than whites withdraw from college, particularly after the first and second years (Allen, 1981; Cross & Astin, 1981; McPartland, 1978; Ramist, 1981; Thomas, 1980). While a great deal has been written on the problem of retaining black college students, much of this research has been performed using all-black student samples. On the other hand, studies which utilize mixed samples do not generally focus on the reasons for (or implications of) differential attrition rates for black and white college students.

Therefore, the present study focuses on two components of the retention and attrition issue which have not been emphasized in the research literature in spite of their critical importance to the field: race and student progression. While the notion of student progression is similar to the notion of student retention, the operational focus of the two concepts differs significantly. Retention research generally tracks students' progress from entry to degree completion by comparing students who drop out of school (usually after one or two years) with those who remain. In this study we likewise track students from entry to degree completion, but in addition to looking at dropout behavior we also compare different groups of students who persist at various points in time after matriculation. In other words, retention is but one component of student progression, and this study looks at both factors associated with staying in school and factors associated with differing progression rates for students who persist at various phases of their college career.

Specifically, the study identifies significant predictors of three components of student progression: (1) attrition; (2) students' tendency to follow the prescribed progression pattern (sophomore in the second year, junior in the third year, senior in the fourth year, and graduate after the fourth year); and (3) the length of time it takes students to graduate (i.e., their overall progression rate). Throughout the paper, our focus is on determining whether race is a significant predictor of student progression. First we investigate the bivariate relationship of race to the above three dependent variables, and then we use multivariate techniques to determine whether the observed relationships persist when the effects of other variables are statistically controlled. Our overriding purpose is to move beyond studies on the determinants of differential attrition rates for black and white students, and on to the question of whether black students (including both those who will ultimately withdraw from college and those who will persist until graduation) tend to progress at a slower pace than white students, and, if so, what factors bring about those differential progression rates.

Description of the Research Project

The present study of student progression rates in higher education stems from efforts by one state higher education system to effectively desegregate undergraduate student enrollments in its state colleges and universities. Because of the paucity of other research on differential progression rates, the study has been designed to address several facets of the progression issue, including:

(1) what normal (or average) progression in higher education is;

(2) what factors are associated with various rates of progression, with special emphasis on the effects of race; and

(3) whether progression rates have any consequences for students' ability to obtain employment in the public and private sectors or admissions into graduate school.

Twenty-four colleges and universities in eight Southern and border states have been selected for participation in the study. Six institutions were chosen from each of the four following categories:

(1) Large public universities with a broad array of degree programs through the doctoral level;

(2) Historically predominantly black public universities;

(3) Regional public universities with limited graduate programs; and

(4) Private universities with broad degree offerings including graduate and professional programs.

The basic criteria used in selecting institutions in each of the categories were type of degree programs offered, total number of students enrolled, and whether there were a sufficient number of black and white students to permit analysis of both races at each university.

Data collection for this study will be conducted in five phases and utilizing several survey instruments. The first phase involves the collection of group-level data from the institutions involved in the study through an Institutional Data Questionnaire (IDQ). The IDQ is divided into four sections. The first section provides information by race on total undergraduate enrollment; SAT and ACT scores for several cohorts of entering freshmen; and the actual progression rates for several cohorts of students (the latter comprise the basis of this paper and are explained in more detail in the next section). The second section of the IDQ identifies how many black and white students receive financial aid (and of what type and amount), and the third section

indicates the number of black and white students who live on- and off-campus. Finally, section four concerns the teaching and administrative personnel of each university, and asks each university to specify the major fields of study for their faculty by race and the racial composition of the total faculty and administrative staff.[1]

This paper presents the preliminary findings from our analysis of the Institutional Data Questionnaire. As our data collection efforts continue, we will determine whether the aggregate relationships found here persist at the individual level. In addition, later analyses of individual-level data will allow us to determine whether the effects of student and institutional characteristics on student progression are mediated by students' perceptions of and integration into the college environment.

Findings

To reiterate, many studies have shown that black students in four-year colleges and universities experience higher attrition rates than white students, particularly after the first and second years (Allen, 1981; Cross & Astin, 1981; McPartland, 1978; Ramist, 1981; Thomas, 1980). Blacks are also less likely to persist full-time, and consequently have lower four-year completion rates than whites (Astin, 1973; Cross & Astin, 1981, McPartland, 1978; Thomas, 1981a). However, some research has shown that the magnitude of the racial difference in college completion rates decreases somewhat if completion subsequent to the prescribed four years is taken into account (Thomas, 1981a). In other words, black students engage in proportionately more part-time and interrupted schooling than white students, and blacks who graduate from college generally take longer to do so (I.S.E.P., 1976; McPartland, 1978; Thomas, 1981a).

The bivariate findings presented here confirm that significant differences exist between black and white students in terms of their persistence rates, their progression rates (defined as length of time to graduate), and the proportion who follow the prescribed progression pattern (sophomore in the second year, junior in the third year, senior in the fourth year, graduate after four years). However, multivariate analyses show that racial differences disappear when the effects of other student and institutional characteristics are statistically controlled.

Our conclusions are derived from the responses of nine predominantly white universities (four large state universities, two relatively non-selective regional universities and three highly selective private universities) and three predominantly black state universities to the Institutional Data Questionnire described earlier. Specifically, all universities in the sample were asked to track three cohorts of entering freshmen (1975, 1976, and 1977) through the fall of 1981. For each cohort of entering students, the universities provided data on the number of students enrolled as freshmen, sophomores, juniors, or seniors in the fall of their second, third, fourth, fifth, sixth, (1975 and 1976 cohorts only) and seventh (1975 cohorts only) years after matriculation. Data were also provided on the numbers of students in each cohort who dropped out (defined to include transfers, voluntary withdrawals and involuntary withdrawals) and graduated during each of the study years. In addition to providing these data for all students combined, the universities also tracked black and white students separately. Thus, for each university in the sample, data are available on six independent cohorts of entering students (blacks entering in 1975, whites entering in 1975, etc.), as well as on all students matriculating in each of the three study years.

In all tables, tendency to follow the prescribed progression pattern is measured in terms of those students who persisted in college at the time of each progression measurement (i.e., dropouts are excluded). This means, for example, that we present the proportion of enrolled students who were sophomores in the fall of their second year. Attrition data are presented separately. This allows us to look at both differential tendencies to drop out of college and differential progression patterns for those students who remained in school. On the other hand, to provide some understanding of the effect of attrition on the final progression stage (graduation), four and five year graduation rates are presented both as a percentage of total students ever enrolled and as a percentage of students who persisted throughout the study period.

Table 1 presents the results of our bivariate analysis of these group level data. This table uses two-tailed Students's t-tests to compare the progression patterns, attrition rates, and mean length of time to graduate for the 36 white and 36 black student cohorts in the sample. Tests of statistical significance were performed and are included in the table; however, any group differences revealed in the table are significant in the context of these 12 universities, since entire populations of entering cohorts were utilized. In addition, tests of significance are only approximate in this instance because of the weighting procedures employed in computing group means.

Table 1 shows that white students were significantly more likely to follow the prescribed progression pattern than black students at nearly all stages of their college career.[2] On the average, 71.0 percent of the white students who persisted until their second year were enrolled as sophomores that year, in comparison to only 57.2 percent of the black students. This means that white students were 13.8 percent more likely than black students to be sophomores in the fall of their second year. White students were 8.7

TABLE 1

STUDENT'S T-TESTS COMPARING PROGRESSION AND RETENTION RATES

OF BLACK AND WHITE STUDENT COHORTS

(GROUPED DATA)

Performance Variable	Mean for White Student Cohorts	Mean for Black Student Cohorts
Prescribed Progression Pattern[1]		
% of Non-Dropouts Who Were Sophomores in Fall of 2nd Year	71.0**	57.2
% of Non-Dropouts Who Were Juniors in Fall of 3rd Year	62.3	53.6
% of Non-Dropouts Who Were Seniors in Fall of 4th Year	63.9**	52.3
% of Non-Dropouts Who Graduated in 4 Years	62.9*	55.6
% of Total Students Who Graduated in 4 Years	43.9*	29.5
% of Non-Dropouts Who Graduated in 5 Years	91.3*	77.9
% of Total Students Who Graduated in 5 Years	56.9*	35.3
Dropout Rates		
% Who Dropped Out by End of First Year	18.8	25.7**
% Who Dropped Out by End of Fourth Year	37.1	49.9*
Progression Rate		
Years to Graduate for Students Who Graduated Within 5 Years (1975 and 1976 Cohorts Only)	4.21	4.31**

*Significantly greater at .01 level of significance using two-tailed Student's t-test.

**Significantly greater at .05 level of significance.

[1]Except where otherwise specified, the comparisons in this section include only students who had not dropped out at the time of each progression measurement.

percent more likely than black students to be enrolled as juniors in the fall of their third year, and 11.6 percent more likely to be seniors in the fall of their fourth year. In terms of graduation rates, 69.2 percent of white students who persisted until graduation graduated within four years, and 91.3 percent graduated within five years. The comparable percentages for black students are only 55.6 percent and 77.9 percent, respectively. This difference in the length of time it took black and white students to graduate is reflected in the overall progression rates shown in Table 1: for students who graduated within five years, white students took an average of 4.21 years to graduate, in comparison to an average of 4.31 years for black students.

Differences in the four- and five-year graduation rates of white and black student cohorts are even larger when we compare the rates for all black and white students ever enrolled (including those who eventually dropped out). On the average, 43.9 percent of all white students ever enrolled graduated from college within four years of their initial enrollment, in comparison to only 29.5 percent of black students. By the end of five years, 56.9 percent of all white students had graduated from college, but only 35.3 percent of all black students graduated during the same period of time. These differences in total graduation rates are at least partially due to the fact that black students were significantly more likely to drop out of college than white students. Black students were 6.9 percent more likely to drop out by the end of their first year, and 12.8 percent more likely to drop out by the end of their fourth year.

The data presented in Table 1 show that there are significant differences in the performance patterns of black and white college students. There are a number of factors that may explain these racial differences. For example, the literature consistently shows that academic factors, including high school

grade point average, high school class rank, and scholastic aptitude, are among the most significant predictors of college performance (Astin & Cross, 1981; Beal & Noel, 1980; Cross & Astin, 1981; Pantages & Creedon, 1978; Pfeifer, 1976; Ramist, 1981). In fact, studies generally find no differences in the attrition rates of black and white students (progression studies are virtually nonexistent) when their academic backgrounds and scholastic ability are statistically controlled (Astin, 1973; Ramist, 1981; Selby, 1973). Black students are also more likely than white students to come from social and economic backgrounds that may contribute to a lack of success in college (Cross & Astin, 1981; Jones, 1979; Ramist, 1981; Selby, 1973).

In addition, there is some evidence that the racial composition of the institutions students attend affects their attrition and progression patterns and mediates the relationship between race and performance (Gosman, Dandridge, Nettles & Thoeny, Note 1; Gosman, Nettles, Dandridge & Thoeny, Note 2). The college "fit" theory states that the greater the congruence between students' goals, values and attitudes and those of the colleges they attend, the more likely they are to perform successfully in terms of persistence and academic achievement (Allen, 1981; Pantages & Creedon, 1978). We found this to be partially true in our earlier analyses of these research data (Gosman, et al., Note 1; Gosman et al., Note 2). Specifically, we found that the underrepresented racial group at both predominantly white and predominantly black universities had higher attrition rates than the majority group, and were less likely to follow the prescribed progression pattern. This may be due in part to differences in the types of students who attend same- and other-race universities (Astin & Cross, 1981; Brown, 1973; Standley, 1978), and in part to racial discrimination experienced by the underrepresented group on both types of campuses (Allen, 1981; Buffkin, 1977; Elam, 1978; Jones, 1979; Pfeifer, 1976). On the

other hand, while black students at predominantly black institutions perform better than white students at the same institutions, over two-thirds of black students attend predominantly white universities. This may explain the lower retention and graduation rates for black students as a whole. Finally, there is also some evidence that both black and white students attending predominantly white institutions perform better than students attending predominantly black institutions in terms of their attrition rates. tendency to follow the prescribed progression pattern, and mean length of time to graduate (Gorman et al., Note 1).

To test for the effects of these individual and institutional characteristics on the bivariate relationships observed earlier, several multiple regressions were performed in which the ten dependent variables presented in Table 1 were regressed on race, combined verbal and mathematical SAT score (mean for cohort), annual family income (mean for cohort), type of institution (predominantly black vs. predominantly white), and proportion of the institution's total enrollment represented by the cohort race. The proportion of the cohort race receiving financial aid was also included as an independent variable even though research concerning the effect of financial aid on performance is inconclusive (Ramist, 1981).

Before presenting the results of these regressions, we must caution that they are based on aggregate data in which student cohorts rather than individual students are the unit of analysis. While it is common to use aggregate data to make inferences about individuals when appropriate individual-level data are unavailable, aggregate data do not always provide unbiased estimates of individual-level relationships, particularly when group effects are present (Firebaugh, 1978). At the same time, however, the problem of cross-level inference is less acute with regression coefficients than with

other measures of association such as correlation coefficients (Goodman, 1959). Therefore, we will interpret our findings as indicative of possible relationships to be further tested with individual-level data obtained in the next phase of the research project.

The regression analyses were performed in three steps. In the first step, all six main effects were entered into the equations concurrently to obtain the independent effects of each predictor with the effects of all other predictors statistically controlled. In the second step, backward exclusion techniques were used to remove all main effects that did not contribute significantly (.05 level) to the explained variance given the presence of the other variables in the equations. Finally, cross-product interaction terms were created between race and the other five main effects. These terms were tested for addition to the reduced-form models via forward inclusion techniques, and interaction terms that added significant explanatory power at the .05 level or greater were added to the models obtained in step two above. Only one interaction term in one analysis was added to the final equations (see Table 2), as this was the only case in which the predictors of performance differed for black and white student cohorts. In other words, with that one exception, the final models do not differ for black and white students, and the predictors of performance are the same for both groups.

Table 2 presents the standardized and unstandardized regression coefficients for the predictors of students' tendency to follow the prescribed progression pattern at five different points in time. It is immediately apparent from Table 2 that race disappears as a significant predictor when the effects of other variables are statistically controlled. Instead, several other variables which our literature review suggested may be related to performance appear as significant predictors. SAT scores,

TABLE 2

REGRESSIONS OF PRESCRIBED PROGRESSION PATTERN RATES[1] ON STUDENT AND INSTITUTIONAL CHARACTERISTICS--

STANDARDIZED AND UNSTANDARDIZED REGRESSION COEFFICIENTS OF

MAIN EFFECTS AND SIGNIFICANT INTERACTION TERMS

(GROUPED DATA)

	Dependent Variables					
	% Sophomores in 2nd Year		% Juniors in 3rd Year		% Seniors in 4th Year	
Independent Variables	Unstandardized	Standardized	Unstandardized	Standardized	Unstandardized	Standardized
Mean Composite SAT Score	.0006**	.982**	.0001	.142	.0003	.527
Race (0 = White)	-.059	-.221	.140	.501	.084	.243
Type of Institution (0 = Predominantly White)	.192**	.655**	.157**	.512**	-.011	-.040
% Receiving Financial Aid	.248**	.690**	-.189**	-.497**	-.004	-.013
Mean Family Income	.000002	.140	.000002	.117	-.000003	-.204
Proportion of Total Enrollment Represented by Cohort Race	.110	.186	.081	.132	.131	.251
Race * Proportion of Total Enrollment[2]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Constant	-.070		.666			
R^2	.384		.266			

NOTES: ** Significant at .05 level (two-tailed).

Coefficients for nonsignificant main effects are those obtained in step one of the regressions, before nonsignificant predictors were removed from the equations. Constants and coefficients for significant main effects are those obtained in steps two and three, when nonsignificant predictors were deleted from the models. Only significant coefficients are presented for interaction terms. Nonsignificant coefficients for interaction terms are represented by "n.s.".

[1]Except where otherwise indicated, the rates include only students who had not dropped out at the time of each progression measurement (i.e., persisters).

[2]All possible cross-product interaction terms between race and other main effects were tested for inclusion in the models, but this is the only term that attained significance in any of the analyses.

TABLE 2 (Continued)

REGRESSIONS OF PRESCRIBED PROGRESSION PATTERN RATES[1] ON STUDENT AND INSTITUTIONAL CHARACTERISTICS--
STANDARDIZED AND UNSTANDARDIZED REGRESSION COEFFICIENTS OF
MAIN EFFECTS AND SIGNIFICANT INTERACTION TERMS
(GROUPED DATA)

	Dependent Variables							
	% of Persisters Graduated in 4 Years		% of Total Graduated in 4 Years		% of Persisters Graduated in 5 Years		% of Total Graduated in 5 Years	
Independent Variables	Unstandardized	Standardized	Unstandardized	Standardized	Unstandardized	Standardized	Unstandardized	Standardized
Mean Composite SAT Score	.0002	.284	.005**	.592**	-.0001	-.241	.0006**	.569**
Race (0 = White)	.127	.326	-.026	-.060	-.042	-.197	-.089	-.165
Type of Institution (0 = Predominantly White)	.047	.101	.319**	.615**	-.094**	-.294**	.154**	.193**
% Receiving Financial Aid	.206**	.369**	.114**	.183**	.122**	.493**	.010	.016
Mean Family Income	.00001**	.843**	.00001**	.625**	.000005**	.640**	.00001**	.546**
Proportion of Total Enrollment Represented by Cohort Race	.166	.228	-.132**	-.163**	-.025	-.077	-.188**	-.235**
Race * Proportion of Total Enrollment[2]	.172**	.317**	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Constant	.264		-.366		.737		-.200	
R^2	.643		.874		.801		.919	

percentage of cohort race receiving financial aid, and type (i.e., racial composition) of institution are, in order of decreasing importance, the significant predictors of the dependent variable entitled "proportion enrolled as sophomores in the fall of the second year." For students who persisted until the second year, high SAT scores and a large proportion receiving financial aid are associated with a greater tendency to be enrolled as sophomores that year. Surprisingly, attendance at a predominantly black institution is also related to a greater tendency to follow the prescribed progression pattern in the second year. This contradicts our earlier finding (Gosman, et al., Note 1) that students at predominantly white institutions perform significantly better than students at predominantly black institutions. The bivariate relationship between type of institution and performance is apparently due in part to differences in the types of students who attend the two types of universities, and actually reverses in direction when the effects of student characteristics such as family income and academic ability are statistically removed. Altogether, SAT scores, percentage receiving financial aid, and type of institution explain 38.4 percent of the variance in the percentage sophomore variable.

SAT scores are not related to progression in the third year, but attendance at a predominantly black institution and low levels of financial aid are associated with enrollment as juniors in the fall of the third year. This underscores the greater tendency of students at predominantly black colleges and universities to follow the prescribed progression pattern when students' individual- and group-level characteristics are statistically controlled. The negative relationship between financial aid and enrollment as juniors in the third year illustrates the inconsistent effect of that variable on performance (it was positively related to progression in the second year).

None of the main effects or interaction terms entered into the analysis are significant predictors of enrollment as seniors in the fall of the fourth year.

In contrast, mean family income consistently appears as the most significant predictor of four- and five-year graduation rates, both for all students ever enrolled and for the subgroup of students who persisted until graduation. High family income is in all cases associated with a greater tendency to graduate within four or five years. High SAT scores are also significantly associated with high four- and five-year graduation rates for all students ever enrolled, but the relationship is nonsignificant for persisters only. Surprisingly, having a small racial representation on campus (i.e., being in the minority) is also associated with high graduation rates in some cases. This may be partially due to the fact that black students attending predominantly white institutions perform better than black students attending predominantly black institutions (Gosman, et al., Note 1). This is, in turn, probably due to differences in the characteristics of black students who attend the two types of institutions (Astin & Cross, 1981). We have apparently failed to control for some of those differences in this analysis, thereby distorting the effect of minority-group status on performance.

The proportion of students receiving financial aid is positively related to four-year graduation rates for both persisters and all students ever enrolled, and to five-year graduation rates for persisters. Again, attendance at a predominantly black university is also associated with high four- and five-year graduation rates for all students ever enrolled; however, it is associated with <u>low</u> five-year graduation rates for persisters. Finally, there is significant interaction between race and racial representation on campus in their effect on four-year graduation rates for persisters. Specifically, racial representation has no effect on the four-year graduation rates of white persisters, but has

a significant positive effect on the rates of black persisters. Altogether, the significant predictors of the various four- and five-year graduation rates explain between 64.3 and 91.9 percent of the variance in those variables.

Table 3 presents the standardized and unstandardized regression coefficients for the predictors of attrition and overall progression (mean number of years to graduate) rates. As was the case with tendency to follow the prescribed progression pattern, the bivariate relationship between race and performance disappears when the effects of other variables are statistically controlled, i.e., race does not exert a significant independent effect on any of the dependent variables in Table 3. The significant predictors of first year attrition rates are (in order of decreasing importance) mean family income, type of institution, racial representation on campus, and proportion of cohort race receiving financial aid. Low mean family income, attendance at a predominantly white college or university, high racial representation (i.e., being in the majority), and high levels of financial aid are associated with high first-year attrition rates. The effects of income are as expected, and we have already shown that financial aid is an inconsistent predictor of performance. Again, however, the effects of type of institution and racial representation are surprising, and may have something to do with differences in the types of students who attend predominantly white and predominantly black universities.

Interestingly, SAT scores are not a significant predictor of first-year attrition rates, but they are the strongest predictor of total attrition at the end of four years. Type of institution is also related to four-year attrition rates, with students attending predominantly white institutions showing higher attrition rates than students attending predominantly black institutions. Mean family income, financial aid, and racial representation

TABLE 3

REGRESSIONS OF ATTRITION RATES AND OVERALL PROGRESSION RATES ON STUDENT AND INSTITUTIONAL CHARACTERISTICS--

STANDARDIZED AND UNSTANDARDIZED REGRESSION COEFFICIENTS OF MAIN EFFECTS[1]

(GROUPED DATA)

	Dependent Variables					
	% Dropped Out By End of First Year		% Dropped Out By End of Fourth Year		Number of Years to Graduate (Progression Rate)	
Independent Variables	Unstandardized	Standardized	Unstandardized	Standardized	Unstandardized	Standardized
Mean Composite SAT Score	-.0002	-.318	-.0009**	-.975**	.0002	.253
Race (0 = White)	-.015	-.060	.115	.290	-.136	-.470
Type of Institution (0 = Predominantly White)	-.218**	-.735**	-.260**	-.546**	.073	.170
% Receiving Financial Aid	.154**	.430**	.102	.178	.007	.020
Mean Family Income	-.000009**	-.945**	-.000009	-.613	-.000006**	-.605**
Proportion of Total Enrollment Represented by Cohort Race	.227**	.484**	.338	.454	-.124	-.289
Constant	.180		1.275		4.370	
R^2	.631		.643		.366	

NOTES: ** Significant at the .05 level (two-tailed).

Coefficients for nonsignificant main effects are those obtained in step one of the regressions, before nonsignificant predictors were removed from the equations. Constants and coefficients for significant main effects are those obtained in steps two and three, when nonsignificant predictors were deleted from the models.

[1]There were no significant cross-product interaction terms.

all disappear as predictors of attrition by the end of the fourth year. Finally, mean family income is the only significant predictor of overall progression rates, and explains 36.6 percent of the variance in that variable. While it is not surprising that income is negatively related to the length of time it takes students to graduate, it is surprising that SAT scores and type of institution do not exert significant independent effects on progression, particularly in view of their significant relationship to progression patterns (Table 2). It is possible that SAT scores and type of institution do have an effect on progression rates at the individual level, but that these rates are especially susceptible to distortion by group effects when aggregate data are employed.

Discussion

Bivariate findings show that race has a strong relationship to students' performance in college, with white students consistently outperforming black students in terms of their attrition rates, tendency to follow the prescribed progression pattern, and mean length of time to graduate. However, racial differences in performance disappear when other student and institutional characteristics are introduced into the prediction models via multiple regression techniques. In other words, while there are significant differences in the performance patterns of black and white college students, those differences are in large part explained by other variables in the regression equations. In fact, when the effects of other predictors are statistically controlled, race shows some surprising relationships to our dependent variables. As expected, white students outperform black students on half of our performance measures, but the reverse is true for the other half. In all cases, however, race is a nonsignificant predictor of performance when the influences of other variables are statistically controlled.

While differing sets of variables enter into the prediction equations for our various measures of performance, four variables repeatedly appear as significant predictors: students' mean SAT scores, students' mean family income, type of institution (predominantly white vs. predominantly black), and proportion of students receiving financial aid. High SAT scores, high family income, and, surprisingly, attendance at a predominantly black university are generally associated with better performance in college when the effects of other variables are removed. Financial aid, on the other hand, shows an inconsistent relationship to performance. In a practical sense it is unfortunate that differing factors are related to students' progression and attrition rates at different phases of their college career. Apparently what is needed are one or two composite dependent variables that will allow us to make more definitive conclusions concerning the determinants of students' persistence in college and their overall ability to progress at a normal pace if they choose to remain in school.

In any case, however, the point we want to make here is not which specific variables are related to student attrition and/or progression; in fact, we reiterate that the group-level findings presented here do not necessarily apply at the individual level. Moreover, our sample of student cohorts is very small, and includes only nine cohorts from predominantly black universities. Instead, the point we want to emphasize is twofold. First, performing this type of multivariate analysis using individual-level data would benefit colleges and universities in several ways. For example, it would allow them to determine what factors influence their students' ability to persist and progress in college, and would provide a sound basis for the enhancement of special retention and progression programs. We have found that universities generally keep track of overall attrition and graduation rates. However, many schools had to be

deleted from our sample because they do not keep track of attrition on an individual basis, nor do they track the progress of students who persist at various points in time. Moreover, even those schools that do retain this information on computer-based data files do not generally use the information to analyze progression and attrition patterns in their student bodies. In spite of this, most have designed special retention programs to assist groups of students they believe are likely to experience difficulty in school. This brings us to our second point: while we cannot at this juncture make definitive conclusions about the determinants of student progression, it is clear that race is probably not a significant predictor. Therefore, colleges and universities would do well to rethink special retention and counseling programs designed especially to serve minority group students. Retention programs will in all likelihood be more effective if they are designed around those characteristics each institution finds to be directly related to the performance of its students. The type of analysis performed here will assist institutions in attaining that goal, and can be performed with relative ease once an appropriate data base is established.

FOOTNOTES

[1]Phases two through five of the study will involve the collection of individual-level data from students and faculty at the sample universities. Through a mailed questionnaire to approximately 10,000 students (Phase II) and personal interviews with a subset of responding students (Phase IV), information will be collected on students' class level and the length of time it took them to get to that point; stop-out or transfer behavior; demographic and academic background; academic motivation; method of financing college; and perceptions of and integration into the college environment. Faculty perceptions of normal progression and of the characteristics, attitudes, and behaviors that contribute to success in college will be collected via a mailed questionnaire (Phase III) and personal interviews (Phase IV). Information will also be collected on the types and amount of interaction faculty have with different types of students. Finally, college recruiters and graduate admissions officers will be interviewed (Phase V) to determine the emphasis they place on college progression rates in making hiring or admissions decisions.

[2]Failure to follow the prescribed progression pattern is not always undesirable, since some of the nonfollowers progressed faster than normal. But our data clearly show that by far the majority of both black and white students who failed to follow the prescribed progression pattern progressed slower than normal. In addition, some of the nonfollowers probably engaged in stopout behavior, which slowed their progression rate but which the literature suggests may have beneficial effects in some cases (Ramist, 1981). We are unable to distinguish stopouts from dropouts in this phase of the research project, but will address that issue when we collect individual-level progression data in the next phase.

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